



US006934932B2

(12) **United States Patent**  
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(10) **Patent No.:** **US 6,934,932 B2**  
(45) **Date of Patent:** **Aug. 23, 2005**

(54) **SYSTEM AND METHOD FOR MANAGING  
WORKFLOW USING A PLURALITY OF  
SCRIPTS**

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(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 652 days.

(21) Appl. No.: **09/978,488**

(22) Filed: **Oct. 16, 2001**

(65) **Prior Publication Data**

US 2004/0205455 A1 Oct. 14, 2004

(51) **Int. Cl.**<sup>7</sup> ..... **G06F 9/44**

(52) **U.S. Cl.** ..... **717/115; 717/102; 715/500;**  
719/320; 705/8

(58) **Field of Search** ..... 717/100–103,  
717/114–115, 168–169, 174–175; 715/500;  
719/320; 705/8

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(57) **ABSTRACT**

A system and method are provided for managing workflow,  
using a plurality of scripts, in a workflow system. The  
method comprises: selecting an MFP device at which the  
document is to be processed; supplying a plurality of folders  
with a corresponding plurality of scripts; selecting a first  
number of folders; processing a document using processes  
such as faxing, scanning, copying, and printing; adding the  
processed document to the selected folders; and, in response  
to adding the processed document to a first number of  
selected folders, generating the document in a first number  
of scripts.

**14 Claims, 2 Drawing Sheets**

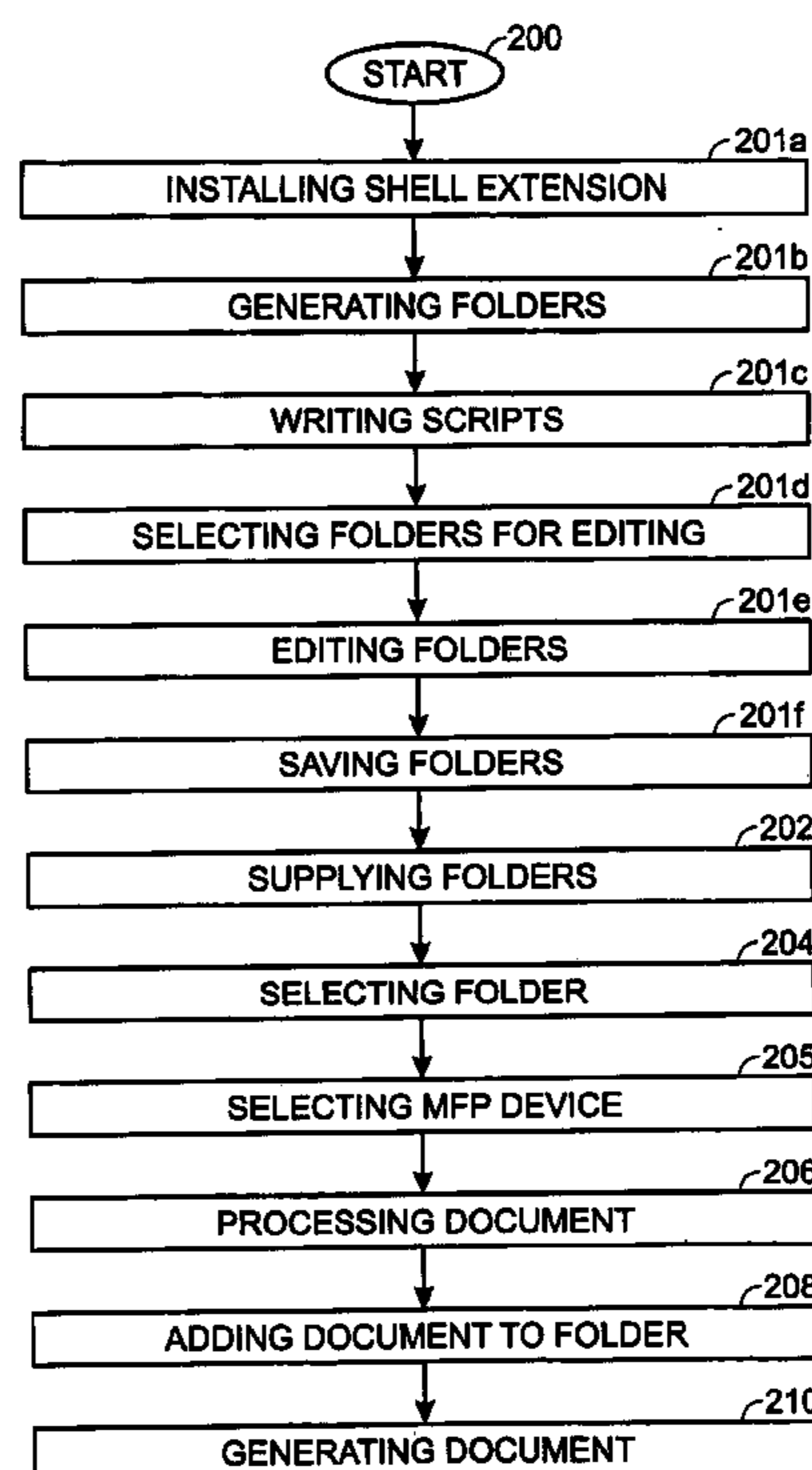


Fig. 1

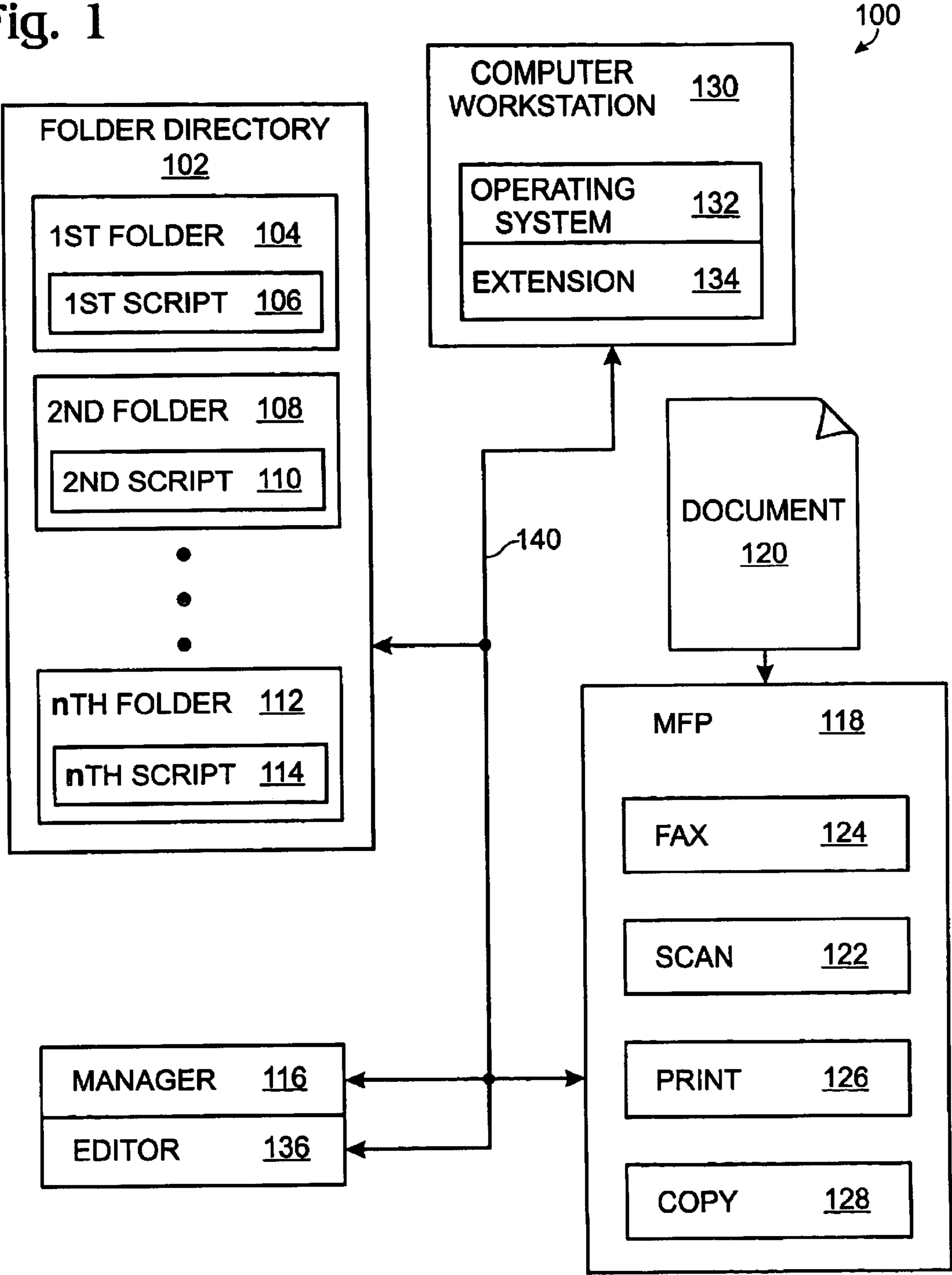
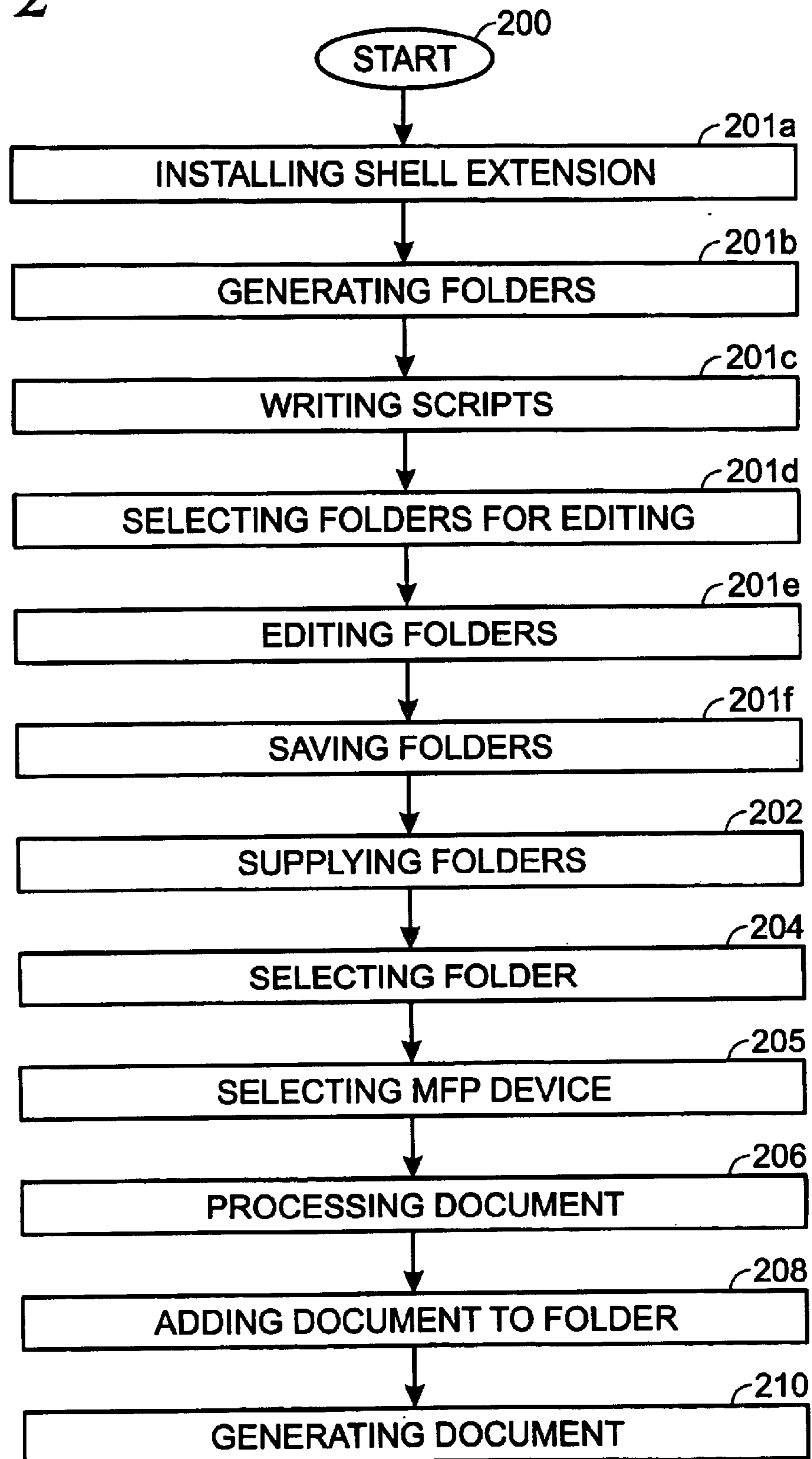


Fig. 2



# SYSTEM AND METHOD FOR MANAGING WORKFLOW USING A PLURALITY OF SCRIPTS

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

This invention generally relates to workflow management and, more particularly, to a system and method for managing workflow using a plurality of different scripts.

### 2. Description of the Related Art

Workflow is a concept that can be expressed as the automatic routing of documents to the users responsible for working on them, "work-flow" on the techweb website. Workflow is concerned with providing the information required to support each step of the business cycle. The documents may be physically moved over the network, or maintained in a single database with the appropriate users given access to the data at the required times. Triggers can be implemented in the system to alert managers when operations are overdue. Alternately stated, workflow is a defined series of tasks within an organization to produce a final outcome, see "workflow" on the webopedia website. In general practice, workflow is a defined set of actions or procedures that occur to a document, after the document is scanned, faxed, or copied into a selected folder.

The manual flow of documents in an organization is prone to errors. Documents can get lost or be constantly shuffled to the bottom of the in basket. Automating workflow sets timers that ensure that documents move along at a prescribed pace and that the appropriate person processes them in the correct order.

Integrating workflow into existing software applications may require extensive reprogramming because, although independent workflow software can launch a whole application, a workflow system must be able to invoke individual routines within the application. As a result, vendors of application software have teamed up with workflow vendors to provide the appropriate interfaces and/or they have developed their own workflow capability. Workflow standards developed by the Workflow Management Coalition (WFMC) are expected to provide interoperability between workflow software and the applications as well as between different workflow systems.

Workflow software is not the same as workgroup software, otherwise known as groupware. Workflow deals with the step-by-step processes, whereas workgroup systems are concerned with information sharing and threaded discussions among users. Groupware, or workgroup computing, focuses on the information being processed and enabling users to share information. Workflow, on the other hand, emphasizes the importance of the process, which acts as a container for the information. Workflow combines rules, which govern the tasks performed, and coordinates the transfer of the information required to support these tasks. This is "process-centered" rather than "information-centered."

Sophisticated workgroup computing applications permit a user to define different workflows for different types of jobs. For example, in a publishing setting, a document might be automatically routed from writer to editor to proofreader to production. At each stage in the workflow, one individual or group is responsible for a specific task. Once the task is complete, the workflow software ensures that the individuals responsible for the next task are notified and receive the data they need to execute their stage of the process.

A workgroup is a collection of individuals working together on a task. Workgroup computing occurs when all the individuals have computers connected to a network that allows them to send email to one another, share data files, and schedule meetings. Sophisticated workgroup systems allow users to define workflows so that data is automatically forwarded to appropriate people at each stage of a process.

A script is a special-purpose command language used to automate sequences within an application such as a spreadsheet or word processor. Macro languages often include programming controls (IF THEN, GOTO, WHILE, etc.), but rarely have the capabilities of a full-blown programming language. Another term for macro or batch file, a script is a list of commands that can be executed without user interaction, see "script" on the webopedia website.

As noted in U.S. Pat. No. 5,960,404 (Chaar et al.), workflow systems are essential to organizations that need to automate their business processes. Workflow systems allow organizations to specify, execute, and monitor their business processes in an efficient manner over enterprise-level networks. This has the net effect of improved throughput of processes, better utilization of organizational resources, and improved tracking of processes.

Many workflow systems are commercially available. Even though many workflow systems exist, interoperability across these systems is a technical problem. The systems are monolithic and proprietary, and workflows cannot extend beyond a single workflow system. To solve this problem, the Workflow Management coalition (WFMC), an industry-wide consortium of major workflow system vendors, has defined a standard workflow architecture, described in the document "The Workflow Reference Model" (WFMC-TC-1003). The model defines the major components of a workflow system and a set of interfaces between workflow system components. The major components it describes are a Process Definition or Builder Tool to capture business process logic in a high-level notation; a Workflow Server that acts as the nerve center of the workflow system; Workflow Clients that are used by users to view and interact with the contents of their worklists; Workflow Applications that are invoked by the workflow server to perform automated activities; and finally, Administration & Monitoring Tools used to administer the execution and monitor the status of work flowing through the workflow system using Audit Data.

The WFMC Reference Model also defines interfaces between these components. Interface 1 (builder-server interface) defines a common process definition format for the interchange of static process specifications between a Process Definition Tool and a Workflow Server (WFMC-WG01-1000). Interface 2 (client-server interface) defines an API that provides a complete range of interactions between a Workflow Client and a Workflow Server (WFMC-TC-1009). These include worklist interaction, query and control of workflow processes and their activities, and administrative functions. Interface 3 (application invocation interface) is intended to describe how applications are invoked. Interface 4 (server-server interface) defines an API that describes the interactions between two Workflow Servers (WFMC-TC-1012). Interactions include initiation, query and control of workflow processes and their activities, and administrative functions. Finally, Interface 5 (monitor-server interface) defines audit data for administering and monitoring a Workflow Server (WFMC-TC-1015).

Workflow typically involves processing documents created by capturing devices, such as a scanner or a facsimile (fax). When a user wants to process documents created by

## 3

capturing devices, they typically run applications such as 'Flow Manager'. These capturing devices can be configured to send the captured data, or documents to a specific folder in the users computer. Even though these workflow applications can be configured to watch some folders on the users personal computer (PC) or computer workstation, it does not allow the user to run different scripts on different folders. To overcome this problem the user must run multiple instances of these applications. This is inconvenient, and in some applications impossible because the application may not permit the user to run multiple instances.

Recent versions of Windows permit users to customize a folder by using scripts, but these scripts are run only when the user has the folders opened. Applications such as Flow Manager can be configured to watch folders for files that are being created. But these applications run the same script on all the watched folders.

It would be advantageous if a plurality of scripts could be generated, in parallel, for any particular processed document.

It would be advantageous if the user could easily generate and edit the plurality of workflow scripts.

## SUMMARY OF THE INVENTION

The objective of this invention is to enhance the workflow processing in an office environment. This invention removes the need for running an application to do workflow processing. This invention allows the user to specify different workflow for different folders, which will run automatically when a document arrives in these folders. That is, the invention enhances workflow processing by integrating workflow into the operating system, permitting the user to run different scripts on different folders automatically.

Accordingly, a method is provided for managing workflow, using a plurality of scripts, in a workflow system. The method comprises: selecting a multifunction peripheral (MFP) device at which the document is to be processed; supplying a plurality of folders with a corresponding plurality of scripts; selecting a first number of folders; processing a document using processes such as faxing, scanning, copying, and printing; adding the processed document to the selected folders; and, in response to adding the processed document to a first number of selected folders, generating the document in a first number of scripts.

The system typically includes at least one computer workstation with an operating system, connected to a MFP device. Then, the method further comprises: installing a shell extension to the computer operating system; in response to accessing the shell extension, generating the first number of folders; writing a script for each of the first number of folders using a protocol selected from the group including Java™ and VB™; in response to accessing the shell extension, selecting folders for editing; editing the scripts in the selected folders; and, saving the folders.

Additional details of the above-mentioned method for managing workflow using a plurality of scripts, and a system for managing workflow using a plurality of scripts are provided below.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic block diagram of the present invention system for managing workflow using a plurality of scripts.

FIG. 2 is a flowchart illustrating the present invention method for managing workflow using a plurality of scripts in a workflow system.

## 4

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Some portions of the detailed descriptions that follow are presented in terms of procedures, steps, logic blocks, codes, processing, and other symbolic representations of operations on data bits within a microprocessor or memory. These descriptions and representations are the means used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art. A procedure, microprocessor executed step, application, logic block, process, etc., is here, and generally, conceived to be a self-consistent sequence of steps or instructions leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical or magnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated in a microprocessor device. It has proven convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers, or the like. Where physical devices, such as a memory are mentioned, they are connected to other physical devices through a bus or other electrical connection. These physical devices can be considered to interact with logical processes or applications and, therefore, are "connected" to logical operations. For example, a memory can store or access code to further a logical operation, or an application can call a code section from memory for execution.

It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated otherwise as apparent from the following discussions, it is appreciated that throughout the present invention, discussions utilizing terms such as "processing" or "connecting" or "translating" or "displaying" or "prompting" or "supplying" or "allocating" or "establishing" or "selecting" or "storing" or "receiving" or "determining" or "displaying" or "recognizing" or the like, refer to the action and processes of in a microprocessor system that manipulates and transforms data represented as physical (electronic) quantities within the computer system's registers and memories into other data similarly represented as physical quantities within the wireless device memories or registers or other such information storage, transmission or display devices.

FIG. 1 is a schematic block diagram of the present invention system for managing workflow using a plurality of scripts. The system 100 comprises a folder directory 102 including a plurality of folders with a corresponding plurality of scripts. Shown are a first folder 104 with a first script 106, a second folder 108 with a second script 110, and an nth folder 112 with an nth script 114. However, the present invention is not limited to any particular number of folders or scripts.

A manager 116 selects folders in the file directory 102. The system 100 includes at least one multifunctional peripheral (MFP) device to process an accepted document 120, and to add the processed document to the selected folders in the file directory 102. Typically, a processed document is an electronic representation of a paper document processed by the MFP. In the broader sense, a document is data that can be processed and scripted. Shown is MFP device 118, but the invention is not limited to any particular number of devices. The MFP device 118 processes, or functions are selected from the group including scanning 122, faxing 124, printing 126, and copying 128.

## 5

For example, the manager **116** selects a first number of folders, say the first folder **104** and the second folder **108**. The folder directory **102** accepts the processed document from the MFP device **118** and generates a first number of scripted documents, in this case two scripts. The folder directory **102** adds the scripted documents to the selected folders.

The system **100** comprises at least one computer workstation **130** with an operating system **132**, connected to the MFP device **118**. Shown is computer workstation **130**, but the invention is not limited to any particular number of computer workstations. A shell extension **134** is connected to the computer operating system **132**. The manager **116** accesses the shell extension **134** to generate the first number of folders in the file directory **102**, and to write a script for each of the first number of folders in the file directory **102**.

The system also comprises an editor **136** to access the shell extension **134**. The editor **136** selects folders in the file directory **102** for editing, and edits the scripts in the selected folders. The manager **116** saves the folders in the file directory **102** after they have been generated or edited. Generally, the manager **116** writes a script for each of the first number of folders using a protocol selected from the group including Java™ and VB™. Likewise, the editor **136** uses Java™ or VB™ to edit the scripts.

It should be understood that in various aspects of the invention that the manager **116**, editor **136**, and file directory **102** may reside with either the computer workstation **130** or the MFP **118**. It should also be understood that the manager **116**, editor **136**, and file directory **102** need not be co-located. The connections, or the network **140** between elements not are not co-located can be made through the Internet or through conventional intranet networks.

## System Operation

The user must first install the present invention shell extension on a conventional computer workstation. This extension permits the user to add or edit the scripts in the folders. The operation continues as follows:

1. the user launches an explorer to access either the manager or the editor;
2. the user either selects an existing folder or creates a new folder;
3. using a context menu the user selects the add/edit workflow option;
4. the user enters a new script, or edits an exiting script in either VB™ or Java™;
5. the user saves the script;
6. the user walks to the MFP;
7. the user configures the MF to send the output to the desktop and selects a workstation;
8. the user uses the network scan tool to add a process that will move the document from that scanner to the folder created in Step 2.

FIG. 2 is a flowchart illustrating the present invention method for managing workflow using a plurality of scripts in a workflow system. Although the method is depicted as a sequence of numbered steps for clarity, no order should be inferred from the numbering unless explicitly stated. The method starts at Step **200**. Step **202** supplies a plurality of folders with a corresponding plurality of scripts. Step **204** selects a first number of folders. Step **206** processing a document. Step **208** adds the processed document to the selected folders. Step **210**, in response to adding the processed document to a first number of selected folders, generates the document in a first number of scripts.

## 6

The system includes at least one multifunctional peripheral (MFP) device with functions comprising scanning, faxing, printing, and copying. Then, processing a document in Step **206** includes using processes selected from the group including scanning, faxing, printing, and copying. Step **205** selects an MFP device at which the document is to be processed.

The system also includes at least one computer workstation with an operating system, connected to a MFP device. Then, the method comprises further steps. Step **201a** installs a shell extension to the computer operating system. Step **201b**, in response to accessing the shell extension, generates the first number of folders. Step **201c** writes a script for each of the first number of folders. Step **201d**, in response to accessing the shell extension, selects folders for editing. Step **201e** edits the scripts in the selected folders. Step **201f** saves the folders.

Writing a script for each of the first number of folders in Step **201c** includes writing a script using a protocol selected from the group including Java™ and VB™.

A system and method have been provided for managing a workflow using a plurality of scripts. Examples have been given for the creation, editing, and use of the present invention workflow process in a Windows environment. However, other variations and embodiments of the invention will occur to those skilled in the art.

I claim:

1. In a workflow system, a method for managing workflow using a plurality of scripts, the method comprising:
  - supplying a plurality of folders with a corresponding plurality of scripts;
  - supplying a document that can be processed using any of the plurality of scripts;
  - selecting a first number of folders;
  - processing the document using the script from each selected folder;
  - creating a first number of scripted documents; and
  - adding the scripted document to the selected folders.
2. The method of claim 1 in which at least one multifunctional peripheral (MFP) device is supplied with functions comprising scanning, faxing, printing, and copying; and
  - wherein processing a document using the script from each selected folder includes using processes selected from the group including scanning, faxing, printing, and copying.
3. The method of claim 1 in which at least one computer workstation with an operating system is supplied, connected to a multifunctional peripheral (MFP) device;
  - the method further comprising:
    - installing a shell extension to the computer operating system;
    - in response to accessing the shell extension, generating the first number of selected folders; and
    - writing a script for each of the first number of folders.
4. The method of claim 3 further comprising:
  - in response to accessing the shell extension, selecting folders for editing; and
  - editing the scripts in the selected folders.
5. The method of claim 4 further comprising:
  - saving the folders.
6. The method of claim 1 further comprising:
  - selecting an multifunctional peripheral (MFP) device at which the document is to be processed.

## 7

7. In a workflow system including a computer workstation and a multifunctional peripheral (MFP) device, a method for managing workflow using a plurality of scripts, the method comprising:

installing a shell extension to the computer operating system;  
 in response to accessing the shell extension, generating a plurality of folders;  
 writing a script for each of the plurality of folders selected from the group including scanning, faxing, printing, and copying;  
 saving the plurality of folders;  
 supplying the plurality of folders with the corresponding plurality of scripts;  
 prior to accepting a document pre-selecting a first number of folders;  
 supplying a document capable of being processed by any of the plurality of scripts;  
 processing the document using the script from each selected folder;  
 generating a first number of scripted documents; and  
 adding the scripted document to the selected folders.

8. A system for managing workflow using a plurality of scripts, the system comprising:

a folder directory including a plurality of folders with a corresponding plurality of scripts;  
 a manager to select folders in the folder directory; and  
 at least one multifunctional peripheral (MFP) device to accept a document capable of being processed using any of the plurality of scripts, to process the document using script from the selected folders, and to add the scripted document to the selected folders.

9. The system of claim 8 wherein the MFP device functions are selected from the group including scanning, faxing, printing, and copying.

10. The system of claim 9 wherein the manager selects a first number of folders and writes a first number of scripts; and

## 8

wherein the MFP processes the document in response to the first number of scripts, and adds the scripted documents to the selected folders in the folder directory.

11. The system of claim 10 further comprising:

at least one computer workstation with an operating system, connected to the MFP device;  
 a shell extension connected to the computer operating system; and

wherein the manager accesses the shell extension to generate the first number of folders in the folder directory, and to write a script for each of the first number of folders.

12. The system of claim 11 further comprising:

an editor to access the shell extension, the editor selecting folders for editing, and editing the scripts in the selected folders.

13. The system of claim 12 wherein the manager saves the folders in the folder directory.

14. A system for managing workflow using a plurality of scripts, the system comprising:

at least one computer workstation with an operating system;  
 a shell extension connected to the computer operating system;  
 a folder directory including a plurality of folders with a corresponding plurality of scripts;

a manager accessing the shell extension to generate a first number of folders in the folder directory, to write a script for each of the first number of folders, to save the folders in the folder directory, and to select a plurality of folders in the folder directory; and

at least one multifunctional peripheral (MFP) device connected to the computer workstation to process an accepted document using a plurality of scripts associated with the plurality of selected folders, to generate a plurality of scripted documents from the accepted document, and to add the plurality of scripted documents to the selected folders.

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